Trend Study 20-5-03

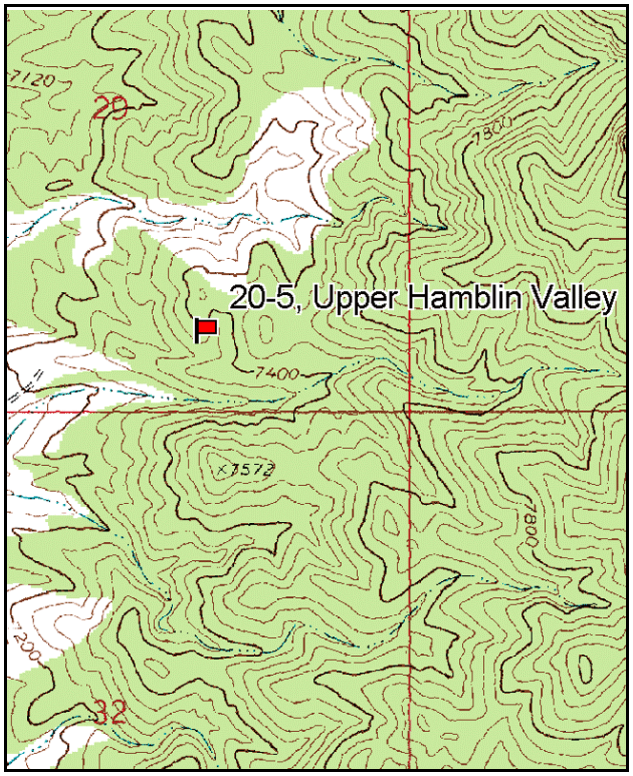
Study site name: Upper Hamblin Valley . Vegetation type: Curlleaf Mtn Mahogany .

Compass bearing: frequency baseline 320 degrees magnetic (line 2 @ 335° M, line 3 @ 340° M, line 4-5 @ 356° M).

Frequency belt placement: line 1 (11ft), line 2 (34ft), line 3 (59ft), line 4 (71ft), line 5 (95ft). Rebar: belt 2 on 5ft, belt 4 on 18ft.

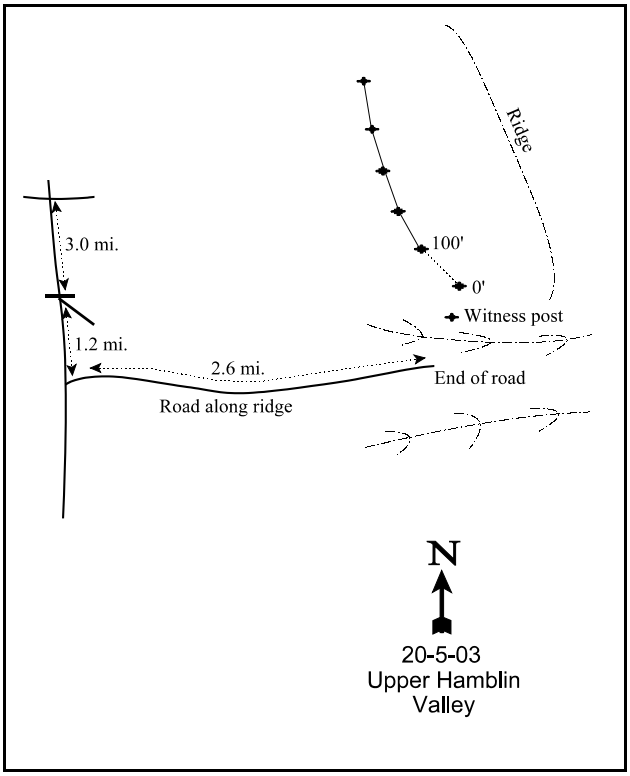
LOCATION DESCRIPTION

From the Indian Peaks cabin go north and west over the Pine Valley Pass Road to Hamblin Valley Road. This intersection has a cattle corral. From this intersection drive north 17.8 miles to another intersection. Turn right and drive 3.0 miles to a cattleguard and stay right and travel south 1.2 miles to a intersection. Turn left and travel east 2.6 miles till the road ends. Park here. The site is on the ridge across the gully to the northwest. The 0-foot stake is 50 feet west of the witness post and can be seen on the ridge side from the end of the road. The 0-foot stake is marked with browse tag #205.



Map Name: Mountain Home Pass

Township 26S , Range 19W , Section 29



Diagrammatic Sketch

GPS: NAD 27, UTM 12S 4266736 N, 239164 E

DISCUSSION

Upper Hamblin Valley - Trend Study No. 20-5

This trend study was established in 1998 to sample important winter range in upper Hamblin Valley. It samples a narrow ridge with a moderately steep (22%) southwest facing slope and an elevation of approximately 7,400 feet. The area supports a singleleaf pinyon pine and Utah juniper overstory with an understory of highly preferred curlleaf mountain mahogany. The site is used heavily by elk and wild horses and to a lesser extent by deer. Sign of horses is evident all over the area including several stud piles along the road to the site. Pellet group data from 1998 estimated approximately 21 elk, 9 deer, and 7 horse days/acre (52 edu/ha, 22 ddu/ha, and 17 hdu/ha). Elk sign appeared to be fairly recent, while most horse sign appeared to be a few months old. Horses have obviously been heavily utilizing the area, however our pellet group transect does not appear to accurately estimate their impact. In 2003, pellet group data indicated that elk use had increased to 44 days use/acre (109 days use/ha). Deer had increased slightly to 11 days use/acre (27 days use/ha), while horse use showed a slight decrease to 4 days use/acre (11 days use/ha).

Soil on the site is fairly shallow and very rocky on the surface and within the profile. Effective rooting depth was estimated at 13 inches. Soil is loam in texture and neutral in reactivity (pH 7.0). Phosphorus appears to be limiting at just 4.5 ppm when 10 ppm is considered to be a minimal value for normal plant development. There is evidence of soil movement in the open spaces between trees and shrubs, and soil pedestalling is also evident. The wash near the site showed signs of recent activity in 1998 but showed no sign of erosion in 2003. Vegetative cover on the site comes almost entirely from trees and shrubs. Herbaceous vegetation, which is more effective at protecting soil, is depleted.

The site supports a variety of preferred browse species including curlleaf mountain mahogany, green ephedra, snowberry, and black sagebrush. Mahogany accounts for about half of the browse cover with a population of 420 plants/acre in 1998 and 520 in 2003. Mature plants are nearly 4 feet in height with a crown diameter of a little over 5 feet. They exhibit some characteristics of littleleaf mountain mahogany (*Cercocarpus intricatus*) due to their characteristically narrow leaf forms. They are most likely hybrid forms between curlleaf and littleleaf mahogany which occurs often in this area. Utilization has been mostly heavy, with 90% of the plants displaying heavy use in 1998 and 65% in 2003. The majority of the mature curlleaf were classified as largely unavailable due to hedging. Even with this high level of use, the population has a fairly well balanced age structure which displays good vigor and no plants being classified as decadent in 2003.

Black sagebrush continues to be the most abundant shrub on the site with an estimated population of 1,000 relatively small statured plants/acre in 2003. Density was at 700 plants/acre in 1998. Use continues to be mostly light. Green ephedra occurs in moderate numbers. Use of this shrub is light to moderate. Most of the ephedra seen along the road to the site had been heavily hedged by what appeared to be mostly wild horses. A small population of snowberry shows mostly light to moderate use.

An overstory of mostly singleleaf pinyon pine trees provided 18% of the browse cover in 2003. Point quarter data shows a increase in pinyon density from 82 trees/acre in 1998 to 126 in 2003. Juniper density also increased from 13 trees/acre to 36 trees/acre. Average basal diameter was estimated at more than 7 inches for pinyon and almost 6 inches for juniper in 2003. Overhead canopy cover is variable, but averaged about 10% over the study site in 2003. As canopy cover for pinyon-juniper communities reaches 10%, this usually begins to depress the production of the understory.

The herbaceous understory is deficient and composed mostly of low value species. Of the four perennial grasses found on the site, only bluebunch wheatgrass is relatively abundant. However, production is poor with all grasses combined producing just over 2% total cover in 1998 and 1% in 2003. Forbs are fairly

diverse but most species are rare in their occurrence. The only common species is the low value rock goldenrod.

1998 APPARENT TREND ASSESSMENT

Soil condition is poor. Sheet erosion appears to be occurring in the bare shrub and tree interspaces. Rock and pavement cover are high and provide 56% cover. This would indicate moderate soil loss in previous years. Herbaceous vegetation and litter cover are poor, leaving the soil poorly protected. Trend will not improve until more herbaceous vegetation becomes established on the site. Trend for browse appears stable. Utilization is extremely high, yet not unusual for curlleaf mountain mahogany. Even so, the population displays good vigor, low decadence, and a balanced age structure. Continued heavy use could eventually have a negative impact. Other preferred shrubs, green ephedra and snowberry, also appear stable. The herbaceous understory is depleted and composition is dominated by mostly poor value forbs. The trend will not improve in the future unless more preferred perennial grasses and forbs become established.

2003 TREND ASSESSMENT

Soil condition continues to be fair to poor, and trend is stable. Sheet erosion still appears to be occurring in the bare shrub and tree interspaces. Rock and pavement cover still remains high and provides the majority of the ground cover (55% cover). This would indicate moderate soil loss in previous years, but not much now because the majority has already been lost. Herbaceous vegetation and litter cover are relatively poor, leaving the soil with little protective cover. Trend will not improve until more herbaceous vegetation becomes established on the site. Trend for browse appears slightly upward. Utilization continues to be very high, yet not unusual for curlleaf mountain mahogany. Even so, the population displays good vigor, low decadence, and a balanced age structure. Continued heavy use could eventually have a negative impact. However, this would probably result in high-lined plants. Other preferred shrubs, green ephedra, snowberry and black sagebrush, also appear stable to slightly up. The herbaceous understory remains depleted with the composition being dominated by one poor value forb, rock goldenrod. Herbaceous trend is slightly down due to a significant decline in the majority of the perennial grasses. The trend will not improve in the future unless more preferred perennial grasses and forbs become established.

TREND ASSESSMENT
soil - stable (3)
browse - slightly up (4)
herbaceous understory - slightly down (2)

HERBACEOUS TRENDS --
Management unit 20 , Study no: 5

Type	Species	Nested Frequency '98	Nested Frequency '03	Average Cover % '98	Average Cover % '03
G	Agropyron spicatum	$_{b}$87	$_{a}$49	1.29	.58
G	Bromus tectorum (a)	$_{b}$17	$_{a}$-	.06	-
G	Oryzopsis hymenoides	10	14	.06	.22
G	Poa secunda	$_{b}$58	$_{a}$21	.78	.27
G	Sitanion hystrix	4	-	.06	-
G	Stipa comata	$_{a}$-	$_{b}$2	-	.01
G	Stipa pinetorum	-	11	-	.05
Total for Annual Grasses		17	0	0.06	0
Total for Perennial Grasses		159	97	2.20	1.14
Total for Grasses		176	97	2.25	1.14
F	Arabis spp.	2	-	.01	-
F	Arenaria spp.	$_{b}$31	$_{a}$7	.19	.02
F	Cryptantha spp.	$_{b}$30	$_{a}$-	.45	-
F	Cymopterus spp.	10	10	.07	.04
F	Delphinium nuttallianum	1	1	.00	.00
F	Descurainia pinnata (a)	3	-	.00	-
F	Draba spp. (a)	$_{b}$193	$_{a}$2	1.47	.00
F	Epilobium brachycarpum (a)	3	-	.01	-
F	Erigeron eatonii	$_{b}$12	$_{a}$-	.08	-
F	Gilia spp. (a)	10	5	.03	.01
F	Leucelene ericoides	69	79	.68	.90
F	Lomatium spp.	$_{b}$31	$_{a}$10	.22	.05
F	Oenothera spp.	5	-	.16	-
F	Petradoria pumila	150	156	4.73	5.77
F	Physaria chambersii	11	1	.07	.00
F	Senecio multilobatus	3	-	.00	-
Total for Annual Forbs		209	7	1.51	0.01
Total for Perennial Forbs		355	264	6.67	6.80
Total for Forbs		564	271	8.19	6.82

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --
Management unit 20 , Study no: 5

Type	Species	Strip Frequency		Average Cover %	
		'98	'03	'98	'03
B	Artemisia nova	17	17	.76	1.37
B	Cercocarpus ledifolius	18	19	7.16	9.25
B	Ephedra viridis	7	7	1.08	1.94
B	Gutierrezia sarothrae	3	11	.03	.24
B	Pinus monophylla	6	6	5.34	3.16
B	Sclerocactus	2	3	.00	.03
B	Symphoricarpos oreophilus	10	9	1.62	1.46
Total for Browse		63	72	16.01	17.48

CANOPY COVER, LINE INTERCEPT --
Management unit 20 , Study no: 5

Species	Percent Cover	
	'98	'03
Artemisia nova	-	1.71
Cercocarpus ledifolius	-	8.11
Ephedra viridis	-	1.50
Pinus monophylla	10.19	8.61
Symphoricarpos oreophilus	-	1.45

KEY BROWSE ANNUAL LEADER GROWTH --
Management unit 20 , Study no: 5

Species	Average leader growth (in)
	'03
Cercocarpus ledifolius	1.0

POINT-QUARTER TREE DATA --
Management unit 20 , Study no: 5

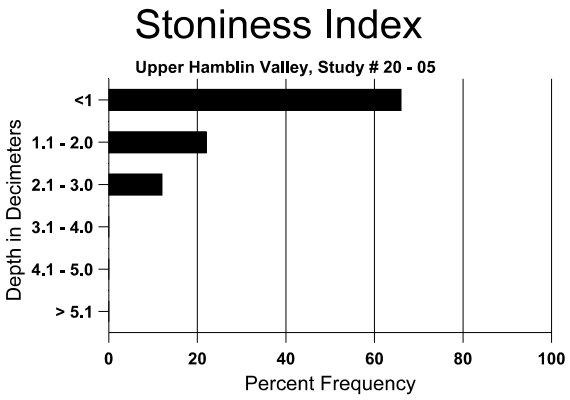
Species	Trees per Acre		Average diameter (in)	
	'98	'03	'98	'03
Juniperus osteosperma	13	36	9.9	5.5
Pinus monophylla	82	126	7.1	7.4

BASIC COVER --
Management unit 20 , Study no: 5

Cover Type	Average Cover %	
	'98	'03
Vegetation	24.20	24.50
Rock	27.03	23.28
Pavement	28.82	31.09
Litter	30.17	24.95
Cryptogams	1.11	.81
Bare Ground	14.01	8.71

SOIL ANALYSIS DATA --
Management unit 20, Study no: 5, Study Name: Upper Hamblin Valley

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	ds/m
13.0	64.0 (12.2)	7.0	44.0	35.4	20.6	3.5	4.5	64.0	0.8



PELLET GROUP DATA --
Management unit 20 , Study no: 5

Type	Quadrat Frequency	
	'98	'03
Rabbit	2	2
Horse	3	2
Elk	8	8
Deer	2	1

Days use per acre (ha)	
'98	'03
-	-
4 (10)	3 (9)
21 (51)	44 (109)
6 (15)	11 (26)

BROWSE CHARACTERISTICS --
Management unit 20 , Study no: 5

		Age class distribution (plants per acre)					Utilization				
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% poor vigor	Average Height Crown (in)
Artemisia nova											
98	**700**	20	100	500	100	60	3	0	14	3	9/19
03	**1000**	-	20	940	40	-	2	0	4	0	6/13
Cercocarpus ledifolius											
98	**420**	20	40	320	60	60	5	90	14	5	41/58
03	**520**	-	20	500	-	40	23	65	0	0	47/63
Ephedra viridis											
98	**160**	-	20	80	60	-	25	25	38	0	28/43
03	**160**	-	-	140	20	20	25	13	13	0	24/32
Gutierrezia sarothrae											
98	**100**	-	-	100	-	-	0	0	-	0	4/6
03	**240**	-	20	220	-	-	0	0	-	0	5/5
Pediocactus simpsonii											
98	**0**	-	-	-	-	-	0	0	-	0	-/-
03	**0**	-	-	-	-	-	0	0	-	0	1/4
Pinus monophylla											
98	**120**	100	40	80	-	-	0	0	-	0	-/-
03	**200**	60	60	140	-	-	0	0	-	0	-/-
Sclerocactus											
98	**40**	20	-	40	-	-	0	0	-	0	2/3
03	**60**	-	-	60	-	-	0	0	-	0	2/6
Symphoricarpos oreophilus											
98	**260**	-	60	200	-	-	31	8	0	0	23/34
03	**240**	-	20	160	60	-	33	0	25	0	24/29